

A new subspecies of Black-striped Sparrow *Arremonops conirostris* from south-eastern Ecuador

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The genus *Arremonops* occurs from Mexico to northern South America and consists of 15 very similar and taxonomically confusing forms with largely allopatric ranges. Most recent authors (e.g. Dickinson 2003, Gill & Wright 2006) rank them as four species, Green-backed Sparrow *A. chloronotus*, Black-striped Sparrow *A. conirostris*, Olive Sparrow *A. rufivirgatus* and Tocuyo Sparrow *A. tocuyensis*, the two former predominantly found in semi-arid to humid habitats, the two latter in arid regions. The ranges of *A. rufivirgatus* and *A. chloronotus* overlap slightly in Honduras and on the Yucatán Peninsula, and the two occasionally hybridise (Howell & Webb 1995). No hybridisation has been reported from the marginally overlapping ranges of *A. conirostris* and *A. tocuyensis* in Colombia and Venezuela (Hilty & Brown 1986, Hilty 2003). The allocation to *A. conirostris* of the form *inexpectatus* of the arid upper Magdalena Valley in Colombia has been disputed (Chapman 1917, Hilty & Brown 1986); it has such a distinctive song and occurs so close (30 km or less) to the wide-ranging (both sides of the Andes) *conirostris* to suggest that they are reproductively isolated.

On 22–23 October 1996 we collected three males and a female of a new taxon of *Arremonops* in south-eastern Ecuador, over 650 km from the nearest known locality east of the Andes. The population is readily diagnosed, but resembles nominate *conirostris*, of Colombia, Venezuela and Brazil, more than any other taxon of *Arremonops*.

Owing to the apparently extreme geographical isolation of the new taxon, its distinctive song, specialised habitat and the difficulty of explaining its origin, we are uncertain of its taxonomic rank. Because it differs less from *A. c. conirostris* than does *A. c. striaticeps*, we take the cautious approach and describe it as a subspecies of *A. conirostris*. Being apparently restricted to the río Pastaza and its tributaries, we name the new form:

Arremonops conirostris pastazae ssp. nov. Pastaza Black-striped Sparrow

Holotype.—Louisiana State University Museum of Natural Science (LSUMZ 161550). Adult male collected by N. Krabbe and D. Stejskal at Isla Sharamentsa, an island in the río Pastaza, at 02°29'S, 77°00'W, elevation 180 m, prov. Pastaza, south-east Ecuador, 23 October 1996. Tissue sample deposited in Zoological Museum, University of Copenhagen (ZMUC 123789). Label data.—37.6 g; no fat. Irides chestnut; maxilla blackish; mandible grey grading to blackish on tip; feet (tarsi and toes) light horn grey. No moult. No *Bursa Fabricii*. Skull 100% ossified. Testes 10 × 5 mm, seminal vesicle large. Stomach insects. Singing in *Tessaria* shrubbery on river island.

Paratypes.—Three additional specimens were collected along with the holotype on Isla Sharamentsa on 22–23 October 1996: LSUMZ 161549 (male), Museo Ecuatoriano de Ciencias Naturales, Quito (MECN) 7036 (male) and MECN 7035 (female). Tissue from the paratypes was deposited at ZMUC (catalogue nos. 123773, 123786, 123772).

Description of the holotype.—Colour numbers follow *Munsell soil color charts* (Munsell Color 1994). Crown between grey and dark grey (2.5Y 5/1–4/1), stripes on side of crown from bill to nape black, fairly broad supercilium from bill to nape grey (2.5Y 6/1). Thin line from bill through eye to sides of neck black, lower sides of head like supercilium, sides of neck like crown. Back dark grey (2.5Y 4/1) washed olive, especially on lower back, rump and tail (5Y 4/4). Wing-coverts and fringes of primaries paler, olive-yellow (5Y 6/6). Fringes of outer four pairs of rectrices pale olive (5Y 5/6). Throat whitish, broad faint breast-band light grey (2.5Y 7/1), central breast washed pale yellow (2.5Y 7/3), sides of body like sides of neck, undertail-coverts pale yellow (2.5Y 7/4), flanks with slight wash of same colour, belly whitish with barely any buff wash, underwing-coverts pale yellow (5Y 8/4), bend of wing bright yellow (5Y 8/8).



Figure 1. Dorsal view of males of Black-striped Sparrow *Arremonops conirostris*. Left two *A. c. pastazae* from Ecuador, right two *A. c. conirostris* from Venezuela (Niels Krabbe)



Figure 2. Ventral view of Black-striped Sparrows *Arremonops conirostris*. Furthest left and right *A. c. pastazae*, middle five, from left to right, two females and three males of *A. c. conirostris* (Niels Krabbe)

TABLE 1
Wing and tail measurements (mm) of males of four taxa of *Arremonops*.

Taxon	Wing (flat) Mean \pm SD; range; <i>n</i>	Tail Mean \pm SD; range; <i>n</i>
<i>striaticeps</i>	80 \pm 1.7; 78–82; <i>n</i> =5	72.8 \pm 3.2; 68–78; <i>n</i> =5
<i>pastaza</i>	77.8 \pm 2.4; 75–81; <i>n</i> =4	65.8 \pm 1.1; 64–67; <i>n</i> =4
<i>conirostris</i> east of Andes	75.3 \pm 2.8; 69–81; <i>n</i> =40	62.3 \pm 3.7; 52–71; <i>n</i> =40
<i>inexpectatus</i>	71; <i>n</i> =1	61.5; 61–62; <i>n</i> =2

Diagnosis.—Similar to *Arremonops c. conirostris*, but larger, bill proportionately larger, back greyer, with less or no olive-green wash (Fig. 1), throat always pure white instead of usually pallid buffy white, belly nearly pure white instead of distinctly washed pale buff, and undertail-coverts pale greyish buff instead of pale buff (Fig. 2). Undertail-coverts much like those of *A. c. inexpectatus* (a taxon that otherwise resembles nominate *conirostris* except for its smaller size, yellower tail and yellower underwing-coverts). Very different from the west Ecuadorian population of *A. c. striaticeps*, from which it differs by being slightly smaller (Table 1), decidedly shorter-tailed and smaller-billed, nearly pure dark grey instead of yellowish olive on the back and wings, darker and greyer on the rump and tail, slightly darker grey on the crown, with a darker supercilium and head-sides, paler yellow underwing-coverts and wing-bend, less extensively yellow underwing-coverts, lacking a pale buff wash to the throat and breast, less washed pale buff on the belly, and greyish buff instead of yellow on the undertail-coverts.

Variation in the series.—All four specimens from the type locality are very similar, as is a fifth, collected at Arapicos (see below). One (LSUMZ 161549) differs slightly in being less washed olive on the back, which is nearly pure dark grey. All three males had chestnut irides. The female had paler (russet) irides, perhaps owing to immaturity rather than to sex. The colour of the feet ranged from light horn grey (male) to light horn brown (both sexes).

Distribution.—Known only from temporarily flooded sandbars and low islands in the upper and middle río Pastaza in south-eastern Ecuador. Besides the type locality, there is a specimen (MECN 5611), taken on 5 September 1961, at Arapicos on the río Palora, a tributary of the río Pastaza (at 01°51'S, 77°56'W; 850–900 m), prov. Morona-Santiago. One was heard by P. Coopmans (pers. comm.) on the río Pastaza at 01°36'S, 77°52'W, 710 m, c.12 km north-east of Arapicos in the late 1990s. The species is absent from islands with similar habitat in the río Napo (pers. obs.).

Habitat.—Apparently confined to stands of *Tessaria integrifolia* (Compositae), a 2–3-m-tall pioneer shrub that forms dense monospecific stands on temporary river sandbars.

Behaviour.—Few data were gathered. Single birds or pairs were observed as they foraged quietly in *Tessaria* scrub within 1–2 m of the ground. They were retiring and foraged on the ground, thereby easily escaping detection. Males sang from near the tops of these shrubs. Stomachs of all four specimens contained insect remains; two also some grit.

Breeding.—All four specimens collected on Isla Sharamentsa on 22–23 October had active gonads. The males were all adults with completely ossified skulls and no *Bursa Fabricii*. The female was younger (large bursa and 10% ossified skull), yet it had fully adult plumage, a large (3 cm) shell-less egg in the oviduct, and a developing brood patch.

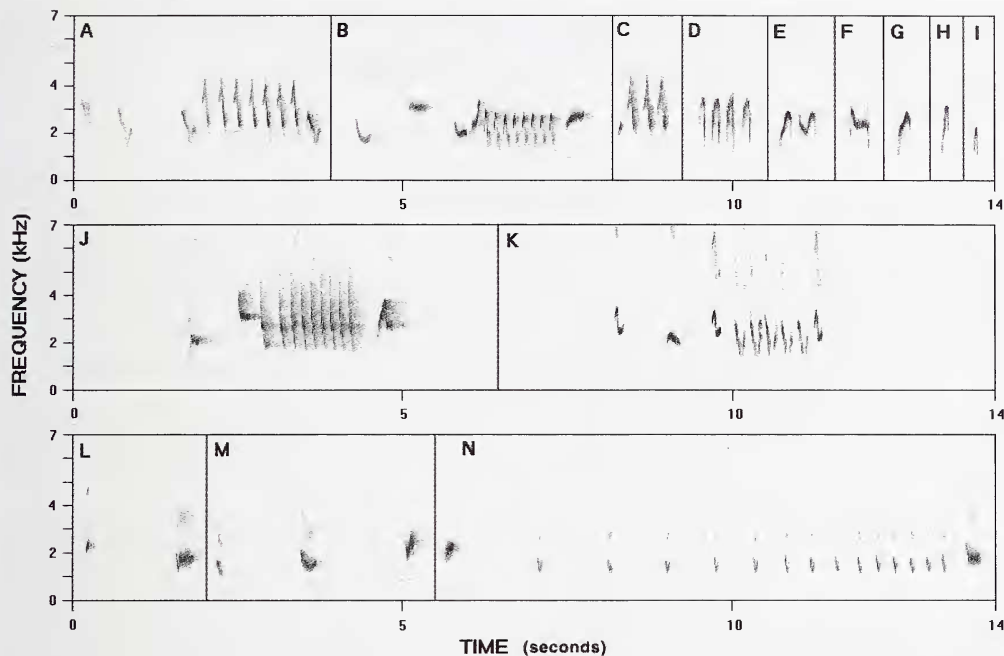


Figure 3. Song phrases of three subspecies of *Arremonops conirostris*. A–I: *A. c. pastazae* (Isla Sharamentsa, Pastaza; N. Krabbe). J–K: *A. c. conirostris* from Venezuela (J: Carabobo; K: Bolívar; both by P. Boesman). L–N: *A. c. striaticeps* from Ecuador (L: Esmeraldas; M–N: El Oro; all by N. Krabbe). Note the highly varied phrases of *pastazae*. The ‘bouncy-ball’ phrase (N) is only rarely given by *striaticeps* in Ecuador and by *conirostris* in Colombia and Venezuela, but is prominent in songs of Middle American forms.

Vocalisations.—Songs of 2–3 different individuals recorded on Isla Sharamentsa (Xeno-canto 19143–19149; see www.xeno-canto.org) consisted of varied phrases, each comprising 1–13 notes at 1.8–3.4 kHz (Fig. 3 A–I), and phrases given at intervals of 3–12 seconds, occasionally in immediate succession. Intervals between phrases were sometimes fairly regular, including between ‘phrases’ of single notes. All notes in our recordings of songs of *A. c. pastazae* differ in pitch or quality from all notes recorded in songs of two individuals of *A. c. conirostris* from Carabobo and Bolívar, Venezuela (Boesman 1999; Fig. 3J–K), but a larger sample might reveal similarity. Different song types in a single individual as well as several local dialects have been described for *A. c. conirostris* (Hilty & Brown 1986, Hilty 2002). Some complicated phrases of *conirostris* and *pastazae* show similarity in structure, being composed of a rapid succession of notes, preceded by 1–3 loud notes and sometimes terminated with one. Their songs differ distinctly in pitch and structure from songs of *A. c. striaticeps* from western Ecuador (Fig. 3L–N), which are usually stereotyped throughout western Ecuador (Fig. 3L) (pers. obs.), but occasionally include an accelerated (‘bouncy-ball’) series of notes (Fig. 3N). Accelerated series’ of notes are common in songs of Middle American forms (Ridgely & Gwynne 1989, Stiles & Skutch 1989, Howell & Webb 1995), but have also been reported from Colombia (Hilty & Brown 1986) and Venezuela (Hilty 2003).

Population size and conservation.—Four to six territorial males were recorded in 2 ha of habitat on Isla Sharamentsa. As estimated from satellite images (Google Earth 2007), between 50 and 100 islands with on average 1 ha of *Tessaria* scrub are found between Isla Sharamentsa and Arapicos, giving a rough estimate of a total population of 100–300 pairs.

If it also occurs on the lower río Pastaza, the population could be two or three times as large. There seems to be no threat to the habitat. Owing to the great dynamics in formation and disappearance of low-lying islands and sandbars in the river, there is little or no use of these islands by humans.

Discussion.—The origin of *A. c. pastazae* is mysterious. Its morphology differs so much from that of west Ecuadorian *striaticeps* that a close relationship between the two seems unlikely. A more plausible route of colonisation would seem to be along the Andes, yet there are no records of *Arremonops* from anywhere east of the Andes between the Macarena Mountains, Colombia, and central Ecuador. As *A. conirostris* is a bird of semi-open habitats, it would be surprising if the species had escaped the detection of early collectors. Another scenario could be one of island hopping from southern Venezuela or Roraima, Brazil. Finally, the range could be relictual, reflecting a much more widespread distribution of such habitats in the past. Even if *pastazae* is the result of a very recent colonisation, the young female in breeding condition (see Breeding) suggests a very short generation time, which might explain a rapid evolutionary rate (see e.g. Sibley & Ahlquist 1990).

The isolated range and distinctive habitat and song of *pastazae*, the reported hybridisation between *A. rufivirgatus* and *A. chloronotus*, the difficulty of referring the Honduran taxon *twomeyi* to one or the other (Howell & Webb 1995), the distinctness of *inexpectatus* despite its close geographical proximity to nominate *conirostris*, and the morphological differences between the two disjunct populations of *striaticeps* (the isolated west Ecuadorian population sometimes separated as *A. s. chrysoma* (P. L. Sclater, 1860) (Chapman 1917) call for a thorough revision of species limits in the genus.

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